SECTION 6 CONTENTS

Tables

MANAGEMENT

Management is the responsibility for control, augmentation and use of a water supply, including storage, diversion, distribution and treatment.

6.1 Introduction

This section describes the existing water management systems for irrigation, municipal, industrial and waterfowl use. Management organizations are listed and general recommendations are made. Management for water quality, fisheries, conservation and groundwater use are covered in other sections of this report. Local management of water supplies throughout the Jordan River Basin consists of a complex mix of cities, towns, irrigation companies and water conservancy districts.

6.2 Setting

To a large extent, the flow of the Jordan River is controlled at the point of outflow from Utah Lake. Also, a number of small reservoirs on tributary streams along the Wasatch Front add a limited management impact upon their outflow. For the most part, however, the flow regimes within the Jordan River Basin are natural. Many of the Jordan River's tributary mountain streams tend to be intermittent (and in many instances ephemeral, particularly on the west side of the valley) with flows ranging during the course of the year from zero to bank-full. Although much of the flow from Wasatch Range streams is diverted for municipal and industrial use, peak flows from Little Cottonwood Creek, Big Cottonwood Creek, Mill Creek, Emigration Creek, and City Creek can be, and have been in recent years, a substantial flooding threat to Salt Lake Valley communities.

The Jordan River Basin has 10 active reservoirs. But they are relatively small and located high in the Wasatch Range. Their primary function is culinary water supply storage, so their size and location preclude their use as flood control or flow management facilities. Table 6-1 lists the active reservoirs and pertinent data. Red Butte reservoir is included, although it is currently inactive.

6.3 Management Entities and Systems

Department of Natural Resources Building in Salt Lake City

6.3.1 Water Quality/Flood Control Management

The overall management of water in the entire Jordan River Basin is a very complex issue requiring the integration of municipal, industrial, agricultural and recreational needs as well as fish and wildlife issues. One of the biggest problems in the Jordan River Basin is the many competing values and interested parties, but no one controlling body or agency. Recognizing the need for increased communication and cooperation among the many federal, state and local governmental agencies and to promote efficient planning, implementation, and coordination of management and regulatory activities, the Salt Lake County Board of Commissioners created an

Table 6-1
EXISTING RESERVOIRS
Jordan River Basin

Name	Built	Stream	Owner	Total Storage (acre-feet)
Little Dell	1993	Dell Creek & Parley's Creek	Corp of Engineers	20,500
Mountain Dell	1925[a]	Dell Creek & Parley's Creek	Salt Lake City	3,514
Lake Mary-Phoebe	1915	Big Cottonwood Creek	Salt Lake City	85
Jordan Valley Water Purification				
Upper Pond	1981		Salt Lake County Water	550
Lower Pond	1982		Conservancy District	46
Twin Lakes	1914	Big Cottonwood Creek	Salt Lake City	486
Red Butte[b]	1930	Red Butte	U.S. Army	385
White Pine Lake	1933	Little Cottonwood Creek	South Despain Ditch Co.	315
Bell Canyon (Lower)	1907	Bells Canyon Creek	Bell Canyon Irr. Co.	25
Red Pine Lake	1929	Little Cottonwood Creek	Little Cottonwood	202
Secret Lake	1926	Little Cottonwood	Water Association	60

a. Mountain Dell Reservoir was originally built in 1917 and enlarged to its present capacity in 1925.
b. Red Butte is currently inactive with stream flows passing directly through the outlet works.

Table 6-2
JORDAN RIVER SUB-BASIN WATERSHED MANAGEMENT COUNCIL

Cities
- Alta
- Bluffdale City
- Draper
- Midvale
- Murray
- Riverton
- Salt Lake City
- Sandy
- South Jordan
- South Salt Lake City
- West Jordan
- West Valley City

Federal Agencies
- Fish and Wildlife Service
- Forest Service
- Army Corps of Engineers

State Agencies
- Department of Agriculture
- Division of Parks and Recreation
- Division of Water Quality
- Division of Water Resources
- Division of Water Rights
- Division of Forestry, Fire and State Lands
- Division of Wildlife Resources
- Salt Lake Soil Conservation District
- Utah State Extension Service

County Agencies
- City/County Health
- Salt Lake County Parks and Recreation
- Salt Lake County Public Works/Engineering and Operations divisions

inter-jurisdictional advisory council named the Jordan River Sub-Basin Watershed Management Council. It assists the Board of County Commissioners in fulfilling its responsibilities for area-wide water quality and flood control activities. Council members are representatives from local, state and federal agencies and entities listed in Table 6-2. Organized

in the summer of 1993, this council meets monthly to discuss Jordan River watershed management issues. Its duties, directed by the Board of County Commissioners, are:

A) Prepare an annual report of activities, in coordination with all governmental agencies represented on the council.
B) Review and evaluate development proposals within the flood channel, flood plain, meander corridor, wetlands, and other areas of important riparian resource values along the Jordan River, and evaluate potential impacts of proposals.
C) Recommend and prioritize planning activities to address or mitigate impacts of development proposals, and coordinate among the parties to effectively review, monitor and evaluate the progress of plan implementation.
D) Coordinate and integrate the interests of parties which may be impacted by proposals for development of mitigation, and assist local, state, and federal management agencies in the prioritization of proposals for potential funding and cost sharing.
E) Recommend priorities for acquisition of critical water related resources, including wetlands, riparian corridors, meander corridors, wildlife reserves, and park lands.

Table 6-3
IRRIGATION COMPANIES

Irrigation Company	Acres Served
Utah and Salt Lake Canal Company	9,300
East Jordan Irrigation Company	6,700
South Jordan Canal Company	5,930
Draper Irrigation Company	4,600
North Jordan Irrigation Company	3,170
Sandy Irrigation Company	2,500
North Point Consolidated Irrigation Company	2,400
Brighton and North Point Irrigation Company	2,000
Green Ditch Water Company	2,000
Union Jordan Irrigation Company	1,700
Little Cottonwood - Tanner Irrigation Co.	1,260
Nickel Irrigation Company	900
Union and East Jordan Irrigation Company	850
Lower Mill Creek Irrigation Company	800
Big Cottonwood Lower Canal Company	800
Sandy Canal Company	800
Richards Irrigation Company	500
Walker Ditch Company	500
McGhie Irrigation Company	480
East Mill Creek Irrigation Company	400
Hill Ditch Irrigation Company	320
Butler Ditch Irrigation Company	300
Little Cottonwood - Brown Ditch Company	300
Galena Canal Company	296
Spring Creek Irrigation Company	275
Rose Creek Irrigation Company	250
Total	49,331

This partial list of Salt Lake County's mutual irrigation companies only includes companies with water rights serving lands in excess of 250 acres.

F) Provide legislative and public education support for present and future stream and river corridor projects and programs, and encourage continuing review of new developments and considerations of innovative practices in technological, legal and administrative aspects of watershed management.

The service areas and the total irrigated acreage of 49,331 acres represents the water rights held by the 26 companies, not the actual acres irrigated. The 1994 water-related land use survey of the basin identified only 25,300 acres of irrigated lands. The current trend of reduced irrigated acreage is discussed in greater detail in Section 10.

6.3.2 Agricultural Water Management

Incorporated mutual irrigation companies serve the majority of irrigated land in the county. The Division of Water Right's *List of Water Companies in Utah* identifies 164 irrigation companies serving the Jordan River Basin. Only 26 of these companies are listed as having service areas exceeding 250 acres. Table 6-3 lists the largest irrigation companies and the acreage served along the Jordan River and contributory watersheds relating to water quality and pollution control, flood control, parkway and other developments, wildlife habitat and wetlands conservation, and proposed plans to effectively manage and regulate these activities.

6.3.3 Management of Municipal and Industrial Water Systems

If a drinking water system serves at least 15 connections, or 25 people at least 60 days per year, it is defined by law as a "public water supply." By this definition, Salt Lake County has at least 78 public drinking water systems. Many of these systems, however, are campground facilities, restaurants, or other similarly localized systems with a relatively small number of hookups and limited clientele. The vast majority of drinking water supplies come from 32 approved community drinking water systems. Although each of these 32 systems has its own independent water sources, many are reliant, at least in part, upon water purchases from one of the two largest wholesale suppliers: Metropolitan Water District of Salt Lake City and Salt Lake County Water Conservancy District. A list of public water suppliers can be found in Table 11-1. Drinking water issues, including a more detailed analysis of the management of the area's public water supplies, and a description of the Metropolitan Water District of Salt Lake City and Salt Lake County Water Conservancy District are included in Section 11, Drinking Water.

Some of the light industries use water delivered through the public water systems. It has been estimated about 5 percent of the public water supply is used for industrial purposes. Most of the industrial water use, however, is self-supplied from privately held water rights, primarily wells. See Section 18 for more detailed information on industrial water use.

6.3.4 Developed Wetlands Management

The Jordan River Basin has an extensive system of developed wetlands which are intensively managed to promote desired waterfowl species and discourage the less desired species. Surface gradients in the developed wetlands are so shallow that a one-inch change in water level can shift pond shorelines hundreds of yards. Because of the land's shallow gradient and because controlling water elevation is the primary means of managing vegetative growth, these wetlands have extensive and precise water control systems. One 3,346-acre duck club has 18 managed water levels, 88 water control structures, over 18 miles of channels and 21 miles of dikes.

Precise water control is also necessary to prevent botulism (which can kill tens of thousands of birds), minimize pond siltation, and control carp and other pests. Some developed wetlands systems allow necessary managed drying of units with minimal effect on surrounding units. Interconnecting systems allow cooperative transport, transfer and reuse of water between entities.

6.3.5 Watershed Management

The mountain streams flowing from the Wasatch Range are a primary source of municipal and industrial water. These streams were among the very first sources of water put to beneficial use by the pioneers in the 1840s and 1850s. Initially these streams were used for irrigation, but they were later changed to culinary use through a series of exchanges. Today these streams and their watersheds are managed primarily for municipal water with limited hydropower. Two documents promote proper management of these sensitive areas. They are: the *Salt Lake City Watershed Management Plan* and the *Salt Lake County Wasatch Canyons Master Plan.*

Salt Lake City has extraterritorial jurisdiction over its watershed areas based on state constitutional rights. Federal legislation in 1914 and 1934 gave further rights to Salt Lake City to protect the watershed areas. The city has recently initiated a review of the *1988 Watershed Master Plan.*

6.3.5.1 Salt Lake City Watershed Management Plan

The *Salt Lake City Watershed Management Plan* was published in 1988 by the planning division of the Salt Lake City Department of Public Works. The plan points out that Salt Lake City owns most of the water rights and a considerable amount of land within the canyons from City Creek Canyon on the north to Little Cottonwood Canyon on the south. The city, consequently, has a responsibility to manage the watersheds.

One of the primary concerns raised by the plan is that use of the canyons for recreational purposes in winter and summer threatens the long-term viability of the watersheds as a culinary water source. The plan maps the canyons, discusses water rights issues, and describes the physical and environmental characteristics of the canyons. The plan also identifies and discusses the various federal, state, county and city agencies that have watershed related jurisdictional and ownership concerns. The heart of the plan is its recommendations for watershed management. After more than a year of plan development and public involvement, the Salt Lake City Council adopted the plan with the following watershed management recommendations:

1. Salt Lake City should continue with existing watershed management policies, and electively increase city presence in some canyons for watershed protection.

2. The city should maintain its moratorium on contracts for sale of surplus water.

3. The city should work with other jurisdictions and private entities to develop a better system for coordinating information and a better public notification process on canyon issues.

4. Salt Lake City should work with canyon public and private entities to assure even enforcement of ordinances and regulations.

5. Salt Lake City should establish a formal program for canyon land and water rights acquisition in critical watershed areas.

6. The city should initiate and maintain an information campaign on the role of the canyons for watershed and water supply, including groundwater, activities in the watersheds, public responsibilities in the watersheds, and policies and jurisdictional responsibilities in the watersheds.

7. Recognizing the value of retention of minimum stream flows in the Wasatch canyons for aesthetic and ecological objectives, the city should review the potential for committing water rights to instream flows on a canyon-by-canyon and case-by-case basis.

8. Salt Lake City should update its watershed ordinance to give the city discretion to implement watershed protection measures in areas where it has water rights, but is not yet using the water.

9. Salt Lake City should review and update its land and water ownership records.

10. In order to invite more public participation on watershed issues, the city should provide broader notification of monthly meeting agendas, community newsletters and other public notices.

11. Salt Lake City should encourage more stream monitoring through the U.S. Geologic Survey and other efforts.

The plan makes the following canyon-by-canyon site specific recommendations:

City Creek - The *City Creek Master Plan (1986)* recommends maintaining instream flows for aesthetic and environmental reasons. This is consistent with the city recently re-establishing City Creek in an above ground channel through the downtown section of the stream. The City Creek watershed currently is managed primarily for culinary water use from the upper canyon.

Red Butte - Red Butte Canyon is the most pristine of all the Wasatch Front Canyons and it should be left in its present management scheme as a Natural Research Area of the Forest Service and that it serve as a benchmark for water quality in the other Wasatch Front canyons.

Emigration Canyon - Water quality in Emigration Canyon is the poorest of all the watersheds. Although Emigration Creek water is not currently used for culinary purposes, the city owns two-thirds of the water rights and its use in the future remains an option. The city has refused sewer line access because Emigration Canyon is outside city boundaries. Canyon annexation has been controversial and forestalled for more than a decade. The watershed management plan recommends the city make an exception to its policy and grant sewer access.

Parley's Canyon - The plan called for the city to restrict recreation at Little Dell Reservoir and denying public recreational use of Mountain Dell Reservoir in order to protect the public water supply. This has changed with the approval of the Army Corps of Engineers' low impact recreation plan around Little Dell Reservoir, which includes picnicking, non-motorized boating and fishing.

Millcreek Canyon - Plans to use Millcreek water for future public water supplies are referenced as the reason for recommending the city increase its watershed management presence in Millcreek Canyon. Watershed management in Millcreek Canyon could be increased if plans are changed. At the present time, however, Millcreek is not being considered for culinary use

Big Cottonwood Canyon - The plan attaches supreme importance to Big Cottonwood Canyon as a culinary water source and recommends the city not support any development not connected to the sewer. The plan also recommends the city work with the Forest Service and County Health Department to monitor water quality and conduct water quality mitigation measures.

Little Cottonwood Canyon - The plan recommends the development of an inter-local agreement with Sandy City and Alta to define the management roles and policies to insure Little Cottonwood Canyon, which has the best water quality of all the Wasatch Mountain canyons, continues to provide excellent water quality.

6.3.5.2 Salt Lake County Wasatch Canyons Master Plan

The purpose of the *Salt Lake County Wasatch Canyons Master Plan* is to guide and coordinate the allocation of future canyon usage in accordance with the present and future needs and resources within the seven major Wasatch Front canyons through the year 2010. The *Salt Lake County Wasatch Canyons Master Plan* is part of the *Salt Lake County Master Plan* and will be used to guide future land-use decisions. In addition to establishing county policy with regards to watershed and water quality issues, the plan addresses private land acquisition and exchanges, environmental issues, public safety, handicapped access, hunting, ski-area expansion, back-country skiing, helicopter skiing, single family development, off-road vehicle use, mining, livestock grazing, mountain biking, hiking, camping, and picnicking.

The watershed and water quality protection policy set forth in the general policies section of the *Wasatch Canyons Master Plan* states:

> "Salt Lake County will continue to cooperate with Salt Lake City- County Board of Health, the U.S. Forest Service and Salt Lake City to implement antidegradation standards, stream set-back and environment zones, monitoring programs, enforcement activities and other canyon watershed policies to maintain excellent water quality in the canyons. All stream segments in the plan area have been designated by the state under the clean water act for antidegradation, which means canyon policies must prevent any water quality degradation."

6.3.6 Cloud Seeding

Winter cloud seeding for augmentation of mountain snowpack is an accepted program in the water supply management community. Some projects in the western United States have been operated continuously for more than 30 years. This relatively long experience indicates that increases of 5-15 percent in seasonal precipitation can be achieved. Cloud seeding in Utah is regulated by the Department of Natural Resources through the Division of Water Resources.

A winter cloud-seeding program was started in the Jordan River Basin in March of 1988 following two years of below normal wintertime precipitation. The

normal operational period is November 15 to April 15 each year. Cloud seeding costs are shared by the state and local governments.

Project operations have used selective seeding which is the most efficient and cost effective and produces the most beneficial results. Selective seeding, which eliminates seeding storms in which natural precipitation has little or no chance of being enhanced, is based on several criteria which determine the seedability of the storm. These criteria deal with the air mass structure of the cloud mass (temperature, stability, wind flow and moisture content).

The Wasatch Front target areas have been Big and Little Cottonwood canyons, City Creek and Parley's Creek (See Figure 3-2). Ground-based seeding generator are used to seed the target area. The increase in precipitation in the target area has been seven to nine percent greater than might have been predicted from nearby control observations. This increase represents 1.5 inches (water equivalence) within the target area.

6.4 Management Problems and Needs

Developmental encroachment in the flood plain is recognized by many as one of the biggest flood control/water quality management problems along the Jordan River corridor. Development in the river's natural flood plain increases flood hazard problems, adversely affects wildlife, degrades water quality, reduces the recreational potential of the river and impedes the river's natural tendency to meander. In an attempt to address this issue, the county, in cooperation with various municipalities, has conducted a study to identify the bounds of the Jordan River's natural meander corridor.

Recreational use of the canyons in the Wasatch Range and Oquirrh mountains is increasing. Without adequate management, this can adversely impact these watersheds, particularly those on the east side of Salt Lake Valley. A good monitoring program is necessary to make sure water quality is not deteriorating.

6.5 Alternatives for Management Improvement

Management alternatives should be considered for potential improvements to the water supply system. Alternatives should be considered and selected on the basis of improving efficient use of the water resources. The concept of total management of surface and groundwater should be considered. Water conservation practices for all uses should also be considered.

6.6 Issues and Recommendations

The biggest management issue in the Jordan River Basin is inter-agency coordination between the many federal, state, county and local municipalities which have some regulatory responsibility pertaining to management of the Jordan Riverway. Closely related is the establishment of a Jordan River Meander Corridor. Establishment of a meander corridor likely will not occur without inter-agency coordination.

6.6.1 Inter-agency Coordination

Issue - Many controlling governmental agencies are involved with the Jordan River whose goals or objectives may differ or various planning efforts may be counter-productive.

Discussion - Local municipalities along with county, state, and federal agencies, need to better coordinate and cooperate their various regulatory and planning efforts, and development activities. With continuing growth and development along the Jordan River, it is increasingly important for various governmental agencies to work together to set common planning goals and establish consistent regulations. The state, Salt Lake City, Salt Lake County and other interested agencies should coordinate their activities to improve the monitoring of flows and water quality from Wasatch Mountain streams and the Jordan River. State regulatory agencies should assist local governmental entities in achieving common goals.

Recommendation - The federal, state and local municipalities should increase efforts to coordinate their activities through the Jordan River Sub-Basin Watershed Management Council. ■